Semper Fit
Injury Prevention

Objectives

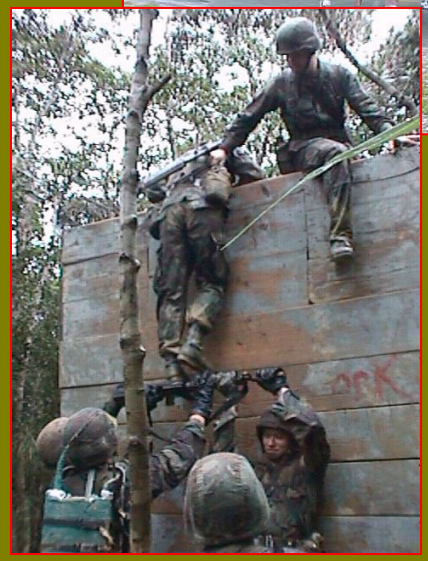
- ✔ Explain general principles of safe physical training
- ✔ List methods that reduce the risk of injury
- ✔ Describe a treatment for common injuries
- ✔ Identify workplace risks and protective measures

General Principles

- ✔ **Cardiovascular fitness**
- ✔ **Muscular strength**
- ✔ **Muscular endurance**
- ✔ **Flexibility**
- ✔ **Leanness**

Conditioning Principles

- ✔ **Specificity**
- ✔ **Intensity**
- ✔ **Overload**
- ✔ **Progressive overload**
- ✔ **Recovery**
- ✔ **Detraining**
- ✔ **Overtraining**



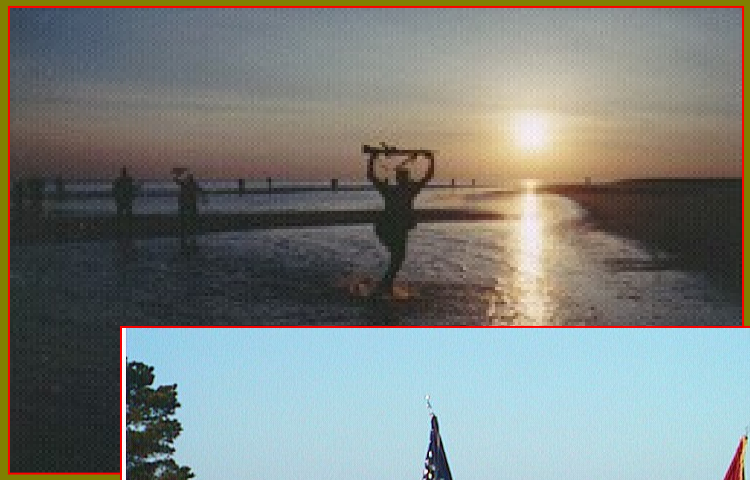
Aerobic Training

Frequency

Intensity

Time

Type



Frequency

- 3 days per week is minimum for cardiovascular system changes
- Increased frequency requires more recovery
  - More sleep
  - Better nutrition
  - Less stress

Intensity

Target Heart Rate (THR) Zone:

- ✔ Predicted max HR = 220 - your age
- ✔ 60% max HR = max HR x 0.60
- ✔ 90% max HR = max HR x 0.90
- ✔ THR Zone = 60% to 90% of max HR

Time

- ✔ Recommend 20 minutes, three times a week
- ✔ 10 minutes is better than nothing
- ✔ 30-60 minutes is optimal

Type

Consider:

- Specificity
- Calories burned
- Enjoyment
- Cross training

Strength Training

Frequency

Intensity

Time

Type

Frequency

- ✔ Provide enough recovery time to match the level of intensity
- ✔ Beginners - 3 x week
- ✔ Advanced - train more often by alternating workouts

Intensity

- % of one rep max - how heavy the weight is
- Perceived exertion - how heavy the weight feels

Intensity Continuum

Beginners: challenging is sufficient

Advanced: hard - past failure

Easy **Challenging** **Hard** **Failure** **Past Failure**

Is training to failure necessary?

Intensity

- ✔ Muscular endurance
  - 30-50% of your 1 rep max
  - 20-100 reps
- ✔ Muscular strength
  - 70-100% of your 1 rep max
  - 1-12 reps per set

Time

- ✔ Number of sets depends on the intensity
  - Beginners: One to two sets per muscle group
  - Advanced: 2-9 sets is sufficient
- ✔ Rest between sets depends on type of workout
  - Shorter rest periods for muscular endurance
  - Longer rest periods for muscle strength

TYPE: Free Weights

- ✔ Barbells and dumbbells
- ✔ Proper technique must be learned
- ✔ Need a spotter

TYPE: Machines

- ✔Adjust the machine to fit your size
- ✔Stabilizer muscles are not trained

TYPE: Circuit Training

- ✔ Combination of aerobic exercise and weight training
- ✔ Two types:
  - Aerobic activity between sets
  - Reduction of rest interval between sets
- ✔ Need space for exercise around equipment
- ✔ Be aware of increased fatigue

Other Considerations

- ✔ Progressive Overload
- ✔ Periodization
- ✔ Rep Cadence
- ✔ Warm up / stretching

Sport Injury Risk Factors

- ✔Low levels of physical fitness
- ✔History of previous injury
- ✔High volume training
- ✔Smoking

How Do Injuries Happen?

- ✔ Unforeseen and unplanned event or circumstance
- ✔ Unfortunate event resulting from carelessness or ignorance

Scope of the Problem

- 10 to 12 million injuries per year
- 30% require medical care
- 5,000 to 7,000 deaths
- Lost time
- Loss of combat readiness

Negative Side Effects of Exercise

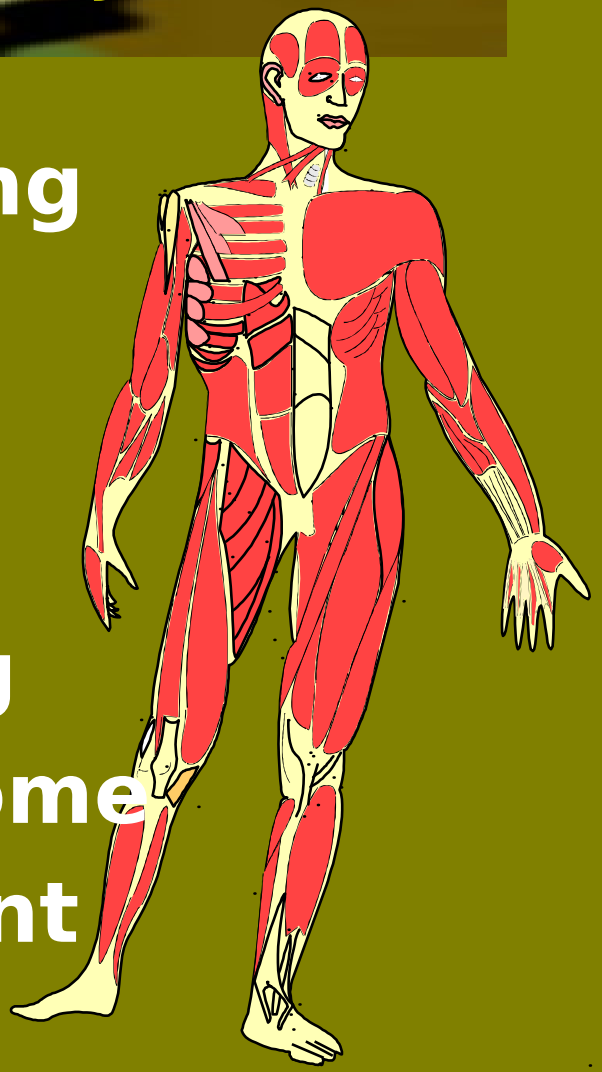
- ✔ Fatigue
- ✔ Muscle soreness
- ✔ Muscle cramps
- ✔ Joint discomfort

Common Sports Injuries

- ✔ **Cuts, bruises, and scratches**
- ✔ **Muscle pulls and strains**
- ✔ **Tendon sprains and swelling**
- ✔ **Ligament strains and ruptures**
- ✔ **Cartilage tears**
- ✔ **Fractures/stress fractures**
- ✔ **Dislocations**

Overuse Sports Injuries

- ✔**Rotator cuff - throwing**
- ✔**Tennis elbow**
- ✔**Jumper’s knee**
- ✔**Heel spur**
- ✔**Shin splints - running**
- ✔**Iliotibial band syndrome**
- ✔**Shoulder impingement**



Environmental Exposure

- **Heat related injuries:**
  - **Sunburn, heat cramps, heat exhaustion, heat stroke**
- **Cold related injuries:**
  - **Sunburn, frostbite, dehydration, hypothermia**

WBGT Index

80 - 84.9 F	Marginal limit of environmental heat stress. Constant supervision of unacclimatized personnel during heavy exercise.
85 - 87.9 F	Limit or suspend strenuous exercise and activity for new and unseasoned personnel during 1st three weeks of heat exposure. Avoid outdoor classes in the sun.
88 - 89.9 F	Limit strenuous exercise for all personnel with less than 12 weeks training in hot weather.
90 F or above	Physical training and strenuous exercise are suspended for all personnel (excludes operational commitment not for training).

Injury Prevention Strategies

- ✔ **Develop resistance to damage**
- ✔ **Lessen hazardous risk - ORM**
- ✔ **Learn good form your experience**
- ✔ **Warm up and cool down**

Injury Prevention Strategies

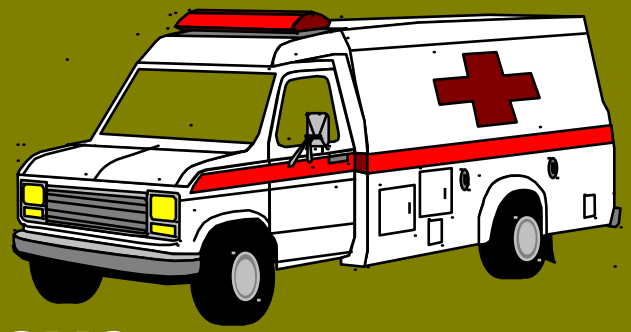
- ✔ **Stay within your limits**
- ✔ **Allow injury recovery time**
- ✔ **Use proper safety gear**
- ✔ **Exercise common sense**

P R I C E

- ✔ **Protect**
- ✔ **Rest**
- ✔ **Ice**
- ✔ **Compression**
- ✔ **Elevation**

Emergencies

- **Head or neck**
  - **Loss of consciousness, eye injury**
- **Chest**
  - **Difficulty breathing**
- **Limbs**
  - **Protruding bones, deformity, inability to move**
- **Cuts**
  - **Severe bleeding**



Workplace Injury

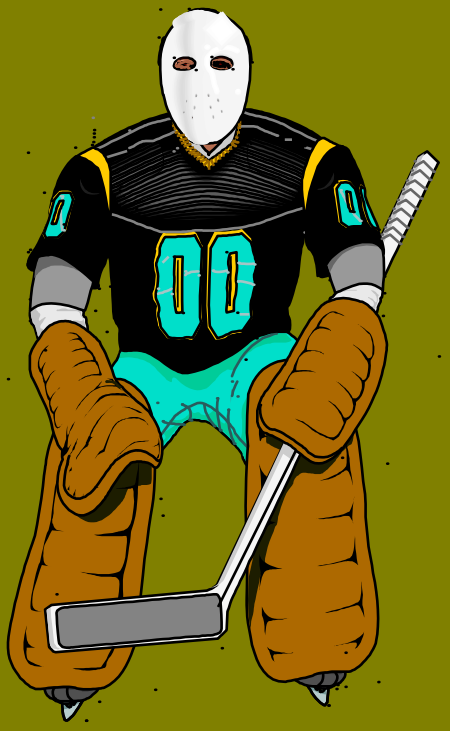
- ✔ **Eye protection**
- ✔ **Hearing protection**
- ✔ **Lung protection**
- ✔ **Lifting procedures/buddy principle**

Workplace Injury

- **Personal Protective Equipment (PPE)**
  - **When and what**
  - **How to wear**
  - **Limitations**
  - **Proper care, inspection & maintenance**
  - **Useful life, storage & disposal**
- **Dehydration awareness**
  - **Essential**
  - **Drink before thirsty**

Summary: Preventing Injuries

- ✔ **Use good form**
- ✔ **Stay within your limits**
- ✔ **Monitor previous injuries**
- ✔ **Use proper equipment**
- ✔ **Warm-up & cool down**



Summary: When Injuries Occur

- ✔ **Immediate medical care when necessary**
- ✔ **First Aid**
  - **Protect, Rest, Ice, Compression, Elevation**
- ✔ **Recovery Period**
  - **Reduce activity of affected area**
  - **Maintain painless range of motion**

DON’T FALL SHORT

BE AWARE

MAKE SAFE CHOICES

REACH YOUR POTENTIAL